

Stabilization of the Isolated Zygomatic Arch Fracture Using Foley's Balloon Catheter

S. Ravi Raja Kumar · K. Venkata Raju ·
K. Sunanda

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Abstract Zygomatic fractures are the most common facial fractures or second in frequency after the nasal fractures. The high incidence of zygomatic fractures probably relates to its prominent position in the facial skeleton hence it is frequently exposed to fractures. This case report presents an isolated zygomatic arch fracture that was been reduced by Gille's temporal approach and stabilized using foley's balloon catheter.

Keywords Zygomatic arch fracture · Stabilization techniques · Foley's balloon catheter

Introduction

The zygoma plays an important role in facial contour since the shape of the face is influenced largely by the underlying osseous structure [4]. Disruption of the zygomatic position has a great functional significance as it creates impairment of ocular and mandibular function. Therefore, the zygomatic injuries have to be properly diagnosed and adequately treated for both cosmetic and functional reasons.

Most frequently fractures of the zygomatic arch are the result of fractures of the entire zygomatic complex (ZMC). However, isolated fractures of the arch without other injuries do occur when a force is applied directly from the lateral aspect of the midface. Though the incidence varies,

isolated zygomatic arch fractures constitute fewer than 10% of zygomatic injuries. The necessity for treatment of these injuries is based on clinical detection of cosmetic or functional disturbances.

Case Report

A 24 year old male patient reported to the department of oral and maxillofacial surgery with a chief complaint of inability to open the mouth wide. The patient gave a history of sports injury. On examination, a depression was found on the right preauricular region (Fig. 1). Palpation over the same area revealed step deformity and tenderness. Patient had restricted mouth opening and his inter incisal distance was found to be 21 mm. The patient was subjected to routine investigations and radiographs like PNS view and submentovertex view (Fig. 2). A diagnosis of right isolated zygomatic arch fracture was made based on the clinical examination and radiographs.

The case was posted for surgery under general anaesthesia. Reduction of the zygomatic arch fracture was done by Gille's temporal approach using Rowe's zygomatic elevator. Foley's catheter (Fig. 3) was placed extraorally, over the temporo-zygomatic region and a marking was done on the Foley's catheter to know the depth of insertion. Now the catheter is inserted up to the marking through the temporal incision such that it lies below the reduced zygomatic arch in the temporal space. The catheter was inflated using 5 ml radio opaque contrast medium (barium sulfate solution) and its position was confirmed using intra operative C-arm (Fig. 4). The Foley's catheter was secured to the temporal region with sutures and an extra oral wound dressing was given. Postoperative submentovertex radiograph (Fig. 5) was taken to reconfirm the position of the

S. Ravi Raja Kumar (✉) · K. Venkata Raju · K. Sunanda
Department of Oral and Maxillofacial Surgery, St. Joseph Dental College and Hospital, Eluru 534 003, Andhra Pradesh, India
e-mail: srrkmaxfac@yahoo.co.in



Fig. 1 Preoperative depression over the zygomatic arch



Fig. 4 Intraoperative photograph

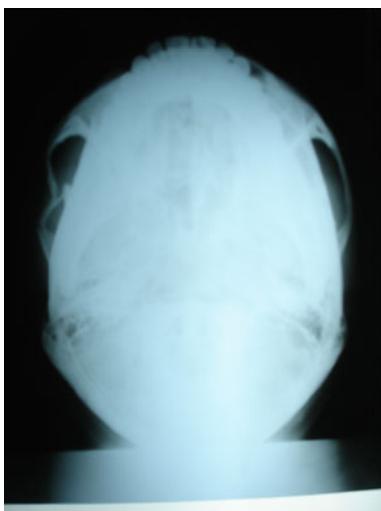


Fig. 2 Preoperative submentovertex view

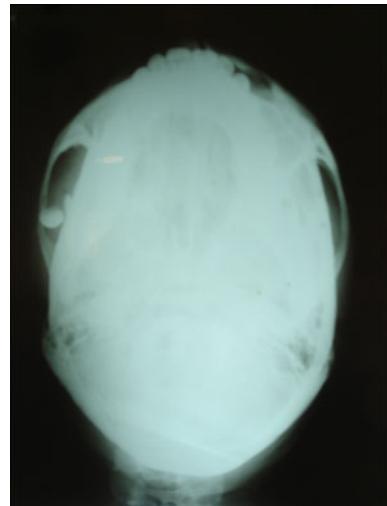


Fig. 5 Postoperative submentovertex view



Fig. 3 Foley's catheter and contrast medium

balloon. After 1 week, the catheter was deflated and removed. The temporal skin and facial-fascial incision were closed using sutures.

Discussion

Treatment of ZMC fractures requires outmost care as it has both cosmetic and functional significance.

Isolated fractures of the zygomatic arch characteristically result in a V-shaped indentation of the lateral aspect of the face. There may be only one definite line of fracture, with bending or green stick fractures in two other areas to produce a W-type configuration of the arch and a V-shaped cosmetic deformity. Occasionally, three definite lines of fractures producing two free segments may occur.

The most commonly practiced surgical technique in fractured zygomatic arch is indirect reduction without fixation. The indirect reduction is done through various approaches like Gille's temporal approach [9], Bala Subrahmaniam upper buccal sulcus approach, Quinn approach [2] and Keen's lateral coronoid approach [11].

The need for stabilizing zygomatic arch fractures varies with the location of the injury, the number of fractures, and the displacement of the segments. The masseter muscle has often been implicated as the primary cause of post reduction displacement of fractured ZMC [12]. It is assumed to be capable of exerting sufficient inferiorly directed force on the fractured zygoma to cause movement, even after surgical insertion of fixation devices.

When considering a temporary support to the reduced zygomatic bone, different types of materials have been used as external devices. The use of an acrylic plate tied over zygomatic arch [3], wooden tongue blade[3], tampons, silicone nasogastric tubes, extra skeletal pins [5], Trans-nasal kirschner wires [1] and custom splints [8] etc., have been reported by various authors. The technique of introducing a roller gauge pack in the maxillary antrum (Antral pack) [6] and antral balloon (Shea Anthony Balloon technique) were popular. These two techniques give mechanical support to the reduced zygomatic bone only on the antero-lateral aspect. But when there is an associated depressed zygomatic arch fracture, the support is necessary from the medio-lateral or postero-lateral aspect. To overcome this problem, Jarabak in 1959 introduced the Foley's catheter through oroantral approach and stabilized the zygomatic arch. Gutman et al. [7] in 1965 reported the use of Foley catheter in the treatment of zygomatic bone fractures. Podoshin and Fradis [10] popularized the procedure of using Foley's catheter below the zygomatic arch through the Gille's temporal approach. Maron and Glover reported the use of Foley's catheter in the treatment of tripod fractures.

The technique of stabilization of the reduced zygomatic arch using Foley's catheter was followed in this case as it is simple and relatively easy with minimal or no complications. Also, the armamentarium required for this technique (Foley's catheter and radio opaque dye) are readily available. The position of the inflated balloon that is supposed to provide temporary stabilization to the reduced zygomatic arch can be readily assessed using C-arm, which is available almost in all the trauma and orthopaedic centres. Undoubtedly, the patient had difficulty in mandibular movements during the initial post operative period because of the placement of the catheter in the infra temporal fossa that prevented the coronoid to move freely. The only suspected complication in this technique is the chance of

retrograde infection which can be avoided by following aseptic technique and use of good antibiotic regimen.

Conclusion

The technique of stabilization of reduced zygomatic arch using Foley's balloon catheter is a relatively easy technique to follow with minimal or no complications.

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